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PATENT

Docket No. 1232-4568

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

UTILITY APPLICATION AND APPLICATION FEE TRANSMITTAL (1.53(b))

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ASSISTANT COMMISSIONER FOR PATENTS
Box Patent Application
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Named Inventor(s) and Address(es): Hideo Takiguchi, 23-35-509, Sugao 5-chome, Miyamae-ku, Kawasaki-shi, Kanagawa-ken, Japan; and Atsushi Kumagai, c/o Canon Ryusei Mukougaoka, 21-11, Shukugawara 2-chome, Tama-ku, Kawasaki-shi, Kanagawa-ken, Japan

For: IMAGE INPUT SYSTEM, ITS CONTROL METHOD, AND STORAGE MEDIUM

Enclosed are:

[X] 27 page(s) of specification, 1 page(s) of Abstract, 9 Page(s) of claims

[X]11 sheets of drawing [X] formal [ ] informal

[X] 6 Page(s) of Declaration and Power of Attorney

[ ] Unsigned
[X] Newly Executed
[ ] Copy from prior application

[ ] Deletion of inventors including Signed Statement under 37 C.F.R. § 1.63(d)(2)

[X] Incorporation by Reference: The entire disclosure of the priority application(s) identified below, is considered as being part of the disclosure of the accompanying application and is incorporated herein by reference.

[ ] Microfiche Computer Program (Appendix)

[ ] _____ page(s) of Sequence Listing

[ ] computer readable disk containing Sequence Listing
[ ] Statement under 37 C.F.R. § 1.821(f) that computer and paper copies of the Sequence Listing are the same

[X] Claim for Priority Japanese Application No. 10-268606 filed 9/22/98

[ ] Certified copy of Priority Document(s)

[ ] English translation documents

[ ] Information Disclosure Statement

[ ] Copy of cited references w/ English Abstracts

[ ] Copy of PTO-1449 filed in parent application serial No._____.

[} Preliminary Amendment

[X] Return receipt postcard (MPEP 503)

[X] Assignment Papers (assignment cover sheet and assignment documents)

[X] A check in the amount of $40.00 for recording the Assignment.

[ ] Assignment papers filed in parent application Serial No. _____.

[ ] Certification of chain of title pursuant to 37 C.F.R. § 3.73(b).

[ ] This is a [ ] continuation [ ] divisional [ ] continuation-in-part (C-I-P) of prior application serial no. _____.

[ ] Cancel in this application original claims _____ of the parent application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

[ ] A preliminary Amendment is enclosed. (Claims added by this Amendment have been properly numbered consecutively beginning with the number following the highest numbered original claim in the prior application.

[ ] The status of the parent application is as follows:

[ ] A Petition For Extension of Time and a Fee therefor has been or is being filed in the parent application to extend the term for action in the parent application until _____.

[ ] A copy of the Petition for Extension of Time in the co-pending parent application is attached.

[ ] No Petition For Extension of Time and Fee therefor are necessary in the co-pending parent application.

[ ] Please abandon the parent application at a time while the parent application is pending or at a time when the petition for extension of time in that application is granted and while this application is pending has been granted a filing date, so as to make this application co-pending.

[ ] Transfer the drawing(s) from the patent application to this application.

[ ] Amend the specification by inserting before the first line the sentence:
This is a [ ] continuation [ ] divisional [ ] continuation-in-part of co-pending application Serial No._____ filed _____.

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I. CALCULATION OF APPLICATION FEE (For Other Than A Small Entity)

	Number Filed		Number Extra	Rate	Basic Fee $ 760.00
Total Claims	26	-20=	6	x$18.00	$ 108.00
Independent Claims	8	- 3=	5	x78.00	$ 390.00
Multiple Dependent Claims	[ ] yes [X] no		Additional Fee = Add'l Fee =	$260.00 NONE	$

Total: $1,258.00

[ ] A statement claiming small entity status is attached or has been filed in the above-identified parent application and its benefit under 37 C.F.R. § 1.28(a) is hereby claimed. Reduced fees under 37 C.F.R. § 1.9(F) (50% of total) paid herewith $ _____.

[X] A check in the amount of $1,258.00 for payment of the application filing fees is attached.

[ ] Charge Fee(s) to Deposit Account No. 13-4500. Order No. _____. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

[X] The Assistant Commissioner is hereby authorized to charge any additional fees which may be required for filing this application, or credit any overpayment to Deposit Account No. 13-4500, Order No. 1232-4568. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,

MORGAN & FINNEGAN, L.L.P.

Dated: September 21, 1999

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Applicant(s)	:	Hideo Takiguchi and Atsushi Kumagai	
Serial No.	:	TBA	Group Art Unit : TBA
Filed	:	September 21, 1999 (Herewith)	
For	:	IMAGE INPUT SYSTEM, ITS CONTROL METHOD, AND STORAGE MEDIUM	

EXPRESS MAIL CERTIFICATE

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Date of Deposit September 21, 1999

I hereby certify that the following attached paper(s) and/or fee
Application Fee Transmittal (in duplicate); 27 pp. of specs., 1 page of abstract, 9 Pp. claims (26 TOTAL claims); 11 Sheets of Formal Drawings (Figs. 1-11); Check in the amount of $1,258.00; 6 pg. Executed Declaration/POA; Assignment Recordation Form Cover Sheet w/ 2 pg. executed Assignment; check in the amount of $40.00; and return receipt postcard

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Box New Applications, Washington, D.C. 20231.

Francisco J. Garcia
Typed or printed name of person mailing paper(s) and/or fee)

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TITLE OF THE INVENTION

IMAGE INPUT SYSTEM, ITS CONTROL METHOD, AND STORAGE MEDIUM

BACKGROUND OF THE INVENTION

The present invention relates to a system which connects an image input device such as a digital camera having a plurality of operation modes, and an image processing apparatus such as a personal computer or the like, and inputs and saves images, its control method, and a storage medium.

Conventionally, when an image captured by a digital camera is input to a personal computer, the following procedure is required:

1. The camera is connected to the personal computer via a serial cable.

2. The user starts an application.

3. A TWAIN driver is started from the application.

4. A button or menu command for connecting the camera is pressed.

5. Thumbnails of images in the camera are displayed on the window of the TWAIN driver.

6. The user selects an image to be captured into the personal computer and presses a capture button.

7. The selected image is transferred to the personal computer.

In this manner, in order to capture an image in the digital camera into the personal computer, a given procedure is required, and the user must have certain knowledge. Recently, an RS-232C serial cable is prevalently used as an I/F for connecting a personal computer and camera. This I/F has high compatibility, i.e., is supported by all personal computers, but has low transfer rate. With the use of this I/F, the configuration of image input software such as a TWAIN driver or the like has a fixed procedure for transferring thumbnail data with a small data size first to display image indices in the camera, and then transferring only original images selected by the user.

However, Microsoft Windows98™ formally supports USB (Universal Serial Bus) as a new I/F, and STI (Still Image Captures Architecture and Interfaces) is prepared as a software I/F for digital cameras. USB has a maximum transfer rate of 10 Mbps; an original image can be directly transferred without making the user feel stress as long as it is a compressed file such as a JPEG file or the like. In this manner, an environment for allowing to readily build image input software with

a higher degree of freedom without fixing the procedure to that for displaying thumbnails and then transferring only a required original image is in order.

USB can implement hot plugin (a USB device can be plugged or unplugged while a PC is running, and the OS can recognize the plugged or unplugged state), and a mechanism for automatically recognizing the connected camera, and automatically starting a predetermined application associated with the camera by the STI can be provided. As can be seen from the above description, an image can be captured from the camera to the personal computer by the following procedure:

(1) The camera is connected.

(2) The associated application is automatically started. The application automatically starts a corresponding TWAIN driver, which automatically connects the camera and displays thumbnails in the camera.

(3) The user selects an image to be captured and presses a capture button.

(4) The selected image is transferred to the personal computer.

In this manner, steps 2. to 5. in the above procedure can be automated.

The STI has a mechanism for starting corresponding PC software in response to connection of

a camera as a trigger. Hence, tedious operation can be greatly reduced, and it is easy even for a novice user of the personal computer to use such system.

However, the STI architecture considers the TWAIN driver as main image input software, and suffers the following shortcomings:

(1) The number of types of applications that can be associated is only one, and the application which runs upon connecting a camera is fixed.

(2) The associated application starts a TWAIN driver corresponding to the camera.

(3) Starting the TWAIN driver means that the application cannot be basically used for purposes other than that for capturing an image into the personal computer.

On the other hand, the digital camera has not only a function of sensing an image, playing back the sensed image on its LCD, and transferring the image to the PC, but also more functions. The number of functions of the digital camera is increasing. For example, the following functions falling outside the range of a function of merely capturing a sensed image into a PC are available:

(1) Slideshow function: All or selected images in the camera are automatically played back on the

camera LCD or on a TV via the video output at predetermined time intervals.

(2) On-line image sensing function: An image is previewed on PC software while the PC is connected to the camera. By pressing an image sensing button of that camera or on PC software, the camera senses the previewed image, and automatically transfers the sensed image to the PC. This function become actually usable after USB is supported as a standard I/F. The conventional RS232C can only preview an image for about one frame per sec in a size as small as a thumbnail image, and is not practical.

(3) Divided image synthesis function: In order to sense a panoramic image which cannot be sensed by single image sensing, image sensing is divisionally done a plurality of number of times. These images are automatically stitched by PC synthesis software (to be referred to as stitch synthesis software hereinafter) to form a panoramic image. Upon synthesis, since a common region in neighboring images is detected to automatically recognize the synthesis position, the neighboring images must have common portions. To facilitate such image sensing, the camera has an image sensing mode called a stitch assist mode. At this time, as shown in Fig. 2, a preview image 4b is displayed while displaying a previously sensed image 4a on an LCD,

so that the user can easily find the common portion (overlap region).

Also, these functions will more often be used in future since they are superior features of digital cameras over film cameras (silver halide cameras).

On the other hand, digital camera users may not always be more or less accustomed with PC operations. That is, users who used film cameras so far may purchase digital cameras as their alternatives. Hence, such users are accustomed with camera operations but are not accustomed with PC operations. Means which allow such users to easily use functions in addition to a function of transferring an image to the personal computer are strongly demanded.

SUMMARY OF THE INVENTION

The present invention has been made in consideration of the above-mentioned problems, and has as its object to provide an image input system which is easy to use, its control method, and a storage medium.

In order to solve the aforementioned problems and to achieve the object, an image input system according to the present invention is characterized by the following arrangement according to its first aspect.

That is, there is provided an image input system comprising an image input device having a plurality of

operation modes, and a computer having a plurality of software programs corresponding to the plurality of operation modes, wherein when the image input device is connected to the computer, when a power supply of the image input device is turned on after the image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer, the software program corresponding to the operation mode of the image input device is automatically started.

An image input system according to the present invention is characterized by the following arrangement according to its second aspect.

That is, there is provided an image input system comprising an image input device having a plurality of operation modes, and a computer having a single software program which has a plurality of modes corresponding to the plurality of operation modes, wherein when the image input device is connected to the computer, when a power supply of the image input device is turned on after the image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer, that one of the plurality of modes of the software in the computer,

which corresponds to the operation mode of the image input device, is automatically started.

A method of controlling an image input system according to the present invention is characterized by the following arrangement according to its first aspect.

That is, there is provided a method of controlling an image input system, which comprises an image input device having a plurality of operation modes, and a computer having a plurality of software programs corresponding to the plurality of operation modes, comprising the step of automatically starting the software program corresponding to the operation mode of the image input device, when the image input device is connected to the computer, when a power supply of the image input device is turned on after the image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer.

A method of controlling an image input system according to the present invention is characterized by the following arrangement according to its second aspect.

That is, there is provided a method of controlling an image input system, which comprises an image input device having a plurality of operation

modes, and a computer having a single software program which has a plurality of modes corresponding to the plurality of operation modes, comprising the step of automatically starting that one of the plurality of modes of the software in the computer, which corresponds to the operation mode of the image input device when the image input device is connected to the computer, when a power supply of the image input device is turned on after the image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer.

A storage medium according to the present invention is characterized by the following arrangement according to its first aspect.

That is, there is provided a storage medium that stores a control program for controlling an image input system, which comprises an image input device having a plurality of operation modes, and a computer having a plurality of software programs corresponding to the plurality of operation modes, the control program comprising a code of the step of automatically starting the software program corresponding to the operation mode of the image input device, when the image input device is connected to the computer, when a power supply of the image input device is turned on after the

image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer.

A storage medium according to the present invention is characterized by the following arrangement according to its second aspect.

That is, there is provided a storage medium that stores a control program for controlling an image input system, which comprises an image input device having a plurality of operation modes, and a computer having a single software program which has a plurality of modes corresponding to the plurality of operation modes, the control program comprising a code of the step of automatically starting that one of the plurality of modes of the software in the computer, which corresponds to the operation mode of the image input device when the image input device is connected to the computer, when a power supply of the image input device is turned on after the image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer.

Other objects and advantages besides those discussed above shall be apparent to those skilled in the art from the description of a preferred embodiment

of the invention which follows. In the description, reference is made to accompanying drawings, which form a part hereof, and which illustrate an example of the invention. Such example, however, is not exhaustive of the various embodiments of the invention, and therefore reference is made to the claims which follow the description for determining the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a view showing an image input device;

Fig. 2 is an explanatory view of a stitch assist mode;

Fig. 3 is a view showing a connection example of the image input device and a computer;

Fig. 4 is a flow chart for explaining operation upon connecting the image input device and computer;

Fig. 5 is a flow chart for explaining operation for starting software corresponding to an operation mode;

Fig. 6 is a flow chart for explaining operation of browser software started in a playback mode;

Fig. 7 is a flow chart for explaining operation of on-line image sensing software started in an image sensing mode;

Fig. 8 is a view showing a display example of on-line image sensing software;

Fig. 9 is a flow chart for explaining operation of stitch synthesis software started in the stitch assist mode;

Fig. 10 is a flow chart for explaining operation of slideshow playback software started in a slideshow playback mode; and

Fig. 11 is a flow chart for explaining operation for starting software in a mode corresponding to an operation mode.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention will be described in detail hereinafter with reference to the accompanying drawings. Prior to the detailed description, an outline of an embodiment of the present invention will be explained.

In this embodiment, when a camera is connected, an application corresponding to the mode set in the camera is started, is connected to the camera, and automatically executes a predetermined process. When the mode of the camera is changed while the camera is already connected and a predetermined application is running, the application is automatically disconnected from the camera, and automatically ends depending on its type or setups, and an application corresponding to

the selected mode is started and is connected to the camera to execute predetermined operation.

In this manner, since operations on the camera main body are mainly used rather than PC operations, and corresponding PC software runs in accordance with setups by means of buttons or switches on the camera main body, a system which is easy even for a user who is not accustomed with PC operations to understand at a glance can be built.

Note that the mode includes the image sensing mode, playback mode, slideshow mode, stitch assist mode, and the like, that have already been described in the paragraphs of the prior art, and these modes can be set using a mode dial switch and push switches of the camera main body, menu items displayed on an LCD panel of the camera, and the like.

Examples of applications which run in correspondence with the respective modes are as follows.

(1) In the playback mode, software which displays images in the camera, and allows the user to browse through them (to be referred to as browser software hereinafter) is automatically started, and automatically reads and displays thumbnails of images in the camera or an original image on its window.

(2) In the image sensing mode, an on-line image sensing mode is automatically set, and on-line image

sensing software is automatically started to automatically display a preview image.

(3) In the stitch assist mode, stitch synthesis software is automatically started, searches for images in the camera, which are sensed in the stitch assist mode, automatically transfers images if such images are found, and executes a synthesis process.

(4) In the slideshow mode, slideshow playback software is automatically started, and plays back images on the PC screen at predetermined time intervals or at mouse click timings or depression timings of a predetermined button (a predetermined key on a PC keyboard or a predetermined button on the camera main body), while reading images in the camera.

The respective embodiments will be described below.

(First Embodiment)

Fig. 1 shows a digital camera used in the first embodiment.

Referring to Fig. 1, reference numeral 1 denotes a USB I/F which is connected to the PC. Reference numeral 2 denotes a mode dial switch which has a playback (Play) mode 2a, image sensing (Rec) mode 2b, stitch assist (Stitch) mode 2c, slideshow playback (Slide) mode 2d, and power OFF 2e. Reference numeral 3 denotes a CF (Compact Flash™) card slot.

Upon using the camera main body alone, when the user turns the mode dial switch from the power OFF position to another mode position and turns on a power switch, the selected mode is started simultaneously. In the image sensing mode, a preview image is displayed on an LCD 4, and an image is sensed by pressing a release switch 5 and is stored in a CF card 6.

In the playback mode, the latest sensed and recorded image is displayed on the LCD 4, and other recorded images are played back in turn by + and - buttons 7a and 7b.

In the stitch assist mode, as shown in Fig. 2, the already sensed image is displayed on one side 4a of the LCD 4, and a preview image is displayed on the other side 4b and can be sensed.

In the slideshow mode, images recorded in the camera are played back on the LCD 4 or on a TV via a video output 8 at predetermined time intervals. At this time, the displayed image can be switched to the next or previous one using the + and - buttons 7a and 7b.

Fig. 3 shows a state wherein the camera and PC are connected via USB.

The camera is connected to the PC and can communicate with it in three states shown in Fig. 4.

In the first example, the camera is connected to the PC via USB while its power switch is ON and a given mode is selected (a mode set by the setting position of, e.g., the mode dial switch) (step S401). In this case, the camera sends a message indicating the mode in which the camera is set currently to the PC at a timing that it detects connection to USB (step S406).

In the second example, the camera is connected to USB while its power switch is OFF, and after that, the power switch is turned on. At this time, the camera also sends a message indicating the mode in which the camera is set currently to the PC in accordance with the set mode (step S406).

In the third example, the camera has already been set in a given mode, the corresponding application has already been started, and the camera and application are connected and communicate with each other. In this state, when the user sets the camera in another mode (step S403), the camera sends a disconnection message to the connected application at that timing to disconnect the communication with the application (step S405). At this time, whether the application automatically ends or is disconnected but kept running depends on the setups of the application. A message indicating a new mode in which the camera is set currently is sent to the PC (step S406). After that,

the camera checks if sensed images are present in the camera (step S407). If no images are present, the camera also sends a message indicating that no images are present in the camera (step S408).

The aforementioned process is executed first when the camera and PC are connected, and an associated application is started.

The STI starts an associated application in correspondence with the message of each mode. Fig. 5 shows this process.

A case will be exemplified below wherein the mode dial switch 2 is set at the playback mode 2a.

Fig. 6 shows operation automatically executed when the browser software associated with the playback mode is started.

It is checked in step S601 if images are present in the camera. This checking step is attained by checking if the message issued in step S408 in Fig. 4 has arrived at the PC. If this message has arrived, the browser software displays a message indicating no image (step S602), and ends itself (step S603).

If images are present, the browser software sends an image transfer request to the camera in step S604. The camera checks if the received message is an image transfer request (step S605), and then checks if all images have already been transferred (step S606). If

images to be transferred still remain, the camera sends image data to the browser software in step S608. The browser software receives the image data in step S609, and displays that image data on the PC screen in step S610.

By repeating these steps, all image data in the camera can be automatically loaded from the camera and can be displayed on the PC. From the viewpoint of user operation, all images in the camera can be automatically displayed on the PC by only setting the mode dial switch 2 at the playback mode 2a.

When another mode is selected at the camera while the browser software is connected to the camera, or when the power switch of the camera is turned off, the camera sends a corresponding message to the browser software. At this time, the browser software executes a process for disconnecting the communication with the camera, and then executes one of the following three options.

The first option automatically ends the browser software, the second option displays a message indicating that the connection with the camera is disconnected by user operation to the user, and prompts the user to select whether the browser software is to end or continue, and the third option continues to run the browser software. These options can be selected

from a setup menu of the browser software. As a default, the second option that prompts the user to select whether the browser software is to end or continue is preferably set.

A case will be exemplified below wherein the mode dial switch is set at the Rec mode 2b. In this case, the on-line image sensing software is started. Fig. 8 shows an example of the on-line image sensing software. An image which is being currently seen by the camera is displayed on a preview area 802 in a window 801 as a preview image. When the user presses an image sensing button 803 at a shutter chance while observing the preview image, the camera senses the image, and sensed image data is displayed on a window 804. When the user presses a save button, the sensed image data can be saved as an image file.

Fig. 7 is a flow chart showing operation executed when the on-line image sensing software is started.

When the mode dial switch 2 is set at the Rec mode 2b, the on-line image sensing software is automatically started. The on-line image sensing software sends a reduced-scale image transmission request to the camera (step S701). This reduced-scale image is to be displayed on the preview area 802. In order to attain preview display that moves as smooth as possible, i.e., to transfer image frames as much as

possible, a reduced-scale image is requested in place of a full-size image which is equal to the sensed image size.

Upon receiving this request (step S702), the camera sends reduced-scale image data (step S703). The on-line image sensing software receives that image data in step S704, and displays the received data on the preview area 802 in step S705. By repeating these steps, a preview image which is being currently sensed by the camera is displayed as a moving image on the preview area 802.

When the user has pressed the image sensing button 803, the control leaves the loop based on the checking result in step S706, and a sensed image transfer request is sent in step S707. Upon receiving this message (step S708), the camera senses an image, and sends sensed full-size image data in step S709. The on-line image sensing software receives this image data in step S710, and displays it on the window 804 in Fig. 8 in step S711.

In this way, the user can automatically preview an image on-line by only setting the mode dial switch 2 at the Rec mode 2b, and can sense that image by pressing the image sensing button on the PC.

When another mode is selected at the camera while the on-line image sensing software is connected to the

camera, or when the power switch of the camera is turned off, the camera sends a corresponding message to the on-line image sensing software. At this time, the on-line image sensing software executes a process for disconnecting the communication with the camera, and then automatically ends itself. The aforementioned browser software has options for selecting, e.g., whether or not the software continues to run, but such options are not available for this software. This is because the on-line image sensing software does not function at all unless it is connected to the camera.

A case will be exemplified below wherein the mode dial switch 2 is set at the stitch assist mode 2c. In this case, the stitch synthesis software is started. Fig. 9 shows operation at that time.

It is checked in step S901 if images are present in the camera. This checking step is attained by checking if the message issued in step S408 in Fig. 4 has arrived at the PC. If this message has arrived, the stitch synthesis software displays a message indicating that no images are stored in the camera (step S902), and ends (step S903).

If images are present, the stitch synthesis software sends a transfer request of images sensed in the stitch assist mode to the camera in step S904. Upon receiving this request, the camera checks if all

stitch assist images have already been transferred (step S905). If stitch assist image to be transferred still remain, image data is transferred to the stitch synthesis software in step S907.

The stitch synthesis software receives this image data in step S908, and saves that image data in a file in step S909. By repeating these steps, all stitch assist image data in the camera can be automatically loaded from the camera. After that, the saved stitch assist images are read out, and a process for stitching these images to obtain a single synthesis image is executed in step S910.

From the viewpoint of user operation, images can be sensed in the stitch assist mode by setting the mode dial switch 2 at the stitch assist mode 2c, and all the stitch assist images in the camera can be automatically loaded into the PC and can be synthesized by only connecting the camera to the PC.

When another mode is selected at the camera while the stitch synthesis software is connected to the camera, or when the power switch of the camera is turned off, the camera sends a corresponding message to the stitch synthesis software. At this time, the stitch synthesis software disconnects the connection with the camera. In this case, if all the stitch assist images in the camera have already been loaded,

the stitch synthesis software continues a synthesis process. However, if all the images have not been loaded yet, the stitch synthesis software automatically ends itself since it cannot execute a synthesis process.

A case will be exemplified below wherein the mode dial switch 2 is set at the slideshow mode 2d. In this case, the slideshow playback software is started. Fig. 10 shows operation at that time.

It is checked in step S1001 if images are present in the camera. This checking step is attained by checking if the message issued in step S408 in Fig. 4 has arrived at the PC. If this message has arrived, the slideshow playback software displays a message indicating that no images are stored in the camera (step S1002), and ends itself (step S1003).

If images are present, the slideshow playback software sends an image transfer request to the camera in step S1004. Upon receiving the request, the camera checks if all images have already been transferred (step S1005).

If images to be transferred still remain, image data is sent to the slideshow playback software in step S1007.

The slideshow playback software receives the image data in step S1008, and saves that image data in a file in step S1009.

By repeating these steps, all image data in the camera can be loaded from the camera. After that, the saved images are read out, and slideshow playback of these images is executed on the PC screen in step S1010.

From the viewpoint of user operations, all images in the camera can be automatically loaded and can be played back as a slideshow by only setting the mode dial switch 2 at the slideshow mode 2d.

When another mode is selected at the camera while the slideshow playback software is connected to the camera, or when the power switch of the camera is turned off, the camera sends a corresponding message to the slideshow playback software. At this time, the slideshow playback software disconnects the connection with the camera. In this case, if all the images in the camera have already been loaded, the slideshow playback software continues slideshow playback. However, if all the images have not been loaded yet, the slideshow playback software automatically ends itself since it cannot execute slideshow playback.

(Second Embodiment)

In the first embodiment, different software programs are started in correspondence with the operation modes of the camera. In this embodiment, a single software program is started in an operation mode corresponding to the operation mode of the camera.

In this case, whether different software programs are started or single software is started in different modes is different from the above embodiment, and only the difference will be explained below.

As shown in Fig. 11, the software is started in different modes in correspondence with the operation modes of the camera.

If it is determined in step S1102 that the camera is in the playback mode, the software is started in an image browsing mode in step S1103. The subsequent operation is the same as that described in the first embodiment.

If it is determined in step S1104 that the camera is in the image sensing mode, the software is started in an on-line image sensing mode in step S1105. The subsequent operation is the same as that described in the first embodiment.

If it is determined in step S1106 that the camera is in the stitch assist mode, the software is started in a stitch synthesis mode in step S1107. The subsequent operation is the same as that described in the first embodiment.

If it is determined in step S1108 that the camera is in the slideshow mode, the software is started in a slideshow playback mode in step S1109. The subsequent

operation is the same as that described in the first embodiment.

(Other Embodiments)

The objects of the present invention are also achieved by supplying a storage medium, which records a program code of a software program that can implement the functions of the above-mentioned embodiments to the system or apparatus, and reading out and executing the program code stored in the storage medium by a computer (or a CPU or MPU) of the system or apparatus.

In this case, the program code itself read out from the storage medium implements the functions of the above-mentioned embodiments, and the storage medium which stores the program code constitutes the present invention.

As the storage medium for supplying the program code, for example, a floppy disk, hard disk, optical disk, magneto-optical disk, CD-ROM, CD-R, magnetic tape, nonvolatile memory card, ROM, and the like may be used.

The functions of the above-mentioned embodiments may be implemented not only by executing the readout program code by the computer but also by some or all of actual processing operations executed by an OS (operating system) running on the computer on the basis of an instruction of the program code.

Furthermore, the functions of the above-mentioned embodiments may be implemented by some or all of actual processing operations executed by a CPU or the like arranged in a function extension board or a function extension unit, which is inserted in or connected to the computer, after the program code read out from the storage medium is written in a memory of the extension board or unit.

To restate, according to the present invention, a software program can be automatically started in correspondence with the mode set in the camera. Or a software program can be started in a software mode corresponding to the mode set in the camera. In this manner, since operations on the camera main body are mainly used rather than PC operations, and corresponding PC software runs in accordance with setups by means of buttons or switches on the camera main body, a system which is easy even for a user who is not accustomed with PC operations to understand at a glance can be built.

The present invention is not limited to the above embodiments and various changes and modifications can be made within the spirit and scope of the present invention. Therefore, to apprise the public of the scope of the present invention the following claims are made.

WHAT IS CLAIMED IS:

1. An image input system connectable to an image input device having a plurality of operation modes comprising:

a computer having a plurality of software programs corresponding to the plurality of operation modes,

wherein at least one of occasions when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer, the software program corresponding to the operation mode of said image input device is automatically started.

2. The system according to claim 1, wherein the operation modes include at least one of an image playback mode, image sensing mode, panoramic image sensing mode, and slideshow playback mode.

3. The system according to claim 2, wherein when the operation mode is the image playback mode, image browsing software is automatically started on said computer, and loads all images in said image input device.

4. The system according to claim 2, wherein when the operation mode is the image sensing mode, image sensing software is automatically started on said computer, and displays a preview image and senses an image on said computer.

5. The system according to claim 2, wherein when the operation mode is the panoramic image sensing mode, panoramic image generation software is automatically started on said computer, automatically loads images, which are sensed in the panoramic image sensing mode and stored in said image input device, and automatically executes a synthesis process of the loaded images.

6. The system according to claim 2, wherein when the operation mode is the slideshow playback mode, slideshow playback software is automatically started on said computer, automatically loads images in said image input device, and automatically displays the loaded images on a screen of said computer.

7. The system according to claim 1, wherein when the power supply of said image input device is turned off while said image input device is connected to said computer and given software is running, the software executes a predetermined process.

8. The system according to claim 7, wherein the predetermined process is one of a process for

automatically ending the software after a disconnection process from the image input device is done, a process for continuing to run the software, and a process for prompting the user to select if the software ends or continues to run.

9. The system according to claim 1, wherein when the operation mode of said image input device is switched to another operation mode while said image input device is connected to said computer and given software is running, one of a process for automatically ending the software after a disconnection process from the image input device is done, a process for continuing to run the software, and a process for prompting the user to select if the software ends or continues to run is executed and, after that, software corresponding to the new operation mode is automatically started.

10. The system according to claim 1, wherein the operation mode is switched by a fixed switch or dial switch on said image input device, or an operation/setup menu in an LCD panel.

11. An image input system connectable to an image input device having a plurality of operation modes comprising:

a computer having a single software program which has a plurality of modes corresponding to the plurality of operation modes,

wherein at least one of occasions when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer, that one of the plurality of modes of the software in said computer, which corresponds to the operation mode of said image input device, is automatically started.

12. The system according to claim 11, wherein the operation modes include at least one of an image playback mode, image sensing mode, panoramic image sensing mode, and slideshow playback mode.

13. The system according to claim 12, wherein when the operation mode is the image playback mode, the software is automatically started in an image browsing mode, and loads all images in said image input device.

14. The system according to claim 12, wherein when the operation mode is the image sensing mode, the software is automatically started in an image sensing mode, and displays a preview image and senses an image on said computer.

15. The system according to claim 12, wherein when the operation mode is the panoramic image sensing mode, the software is automatically started in a panoramic

image generation mode, automatically loads images, which are sensed in the panoramic image sensing mode and stored in said image input device, and automatically executes a synthesis process of the loaded images.

16. The system according to claim 12, wherein when the operation mode is the slideshow playback mode, the software is automatically started in a slideshow playback mode, automatically loads images in said image input device, and automatically displays the loaded images on a screen of said computer.

17. The system according to claim 11, wherein when the power supply of said image input device is turned off while said image input device is connected to said computer and the software is running, the software executes a predetermined process.

18. The system according to claim 17, wherein the predetermined process is one of a process for automatically ending the software after a disconnection process from the image input device is done, a process for continuing to run the software, and a process for prompting the user to select if the software ends or continues to run.

19. The system according to claim 11, wherein when the operation mode of said image input device is switched to another operation mode while said image

input device is connected to said computer and the software is running, the software is automatically switched to a mode corresponding to the new operation mode.

20. The system according to claim 11, wherein the operation mode is switched by a fixed switch or dial switch on said image input device, or an operation/setup menu in an LCD panel.

21. A method of controlling an image input system, which is connectable to an image input device having a plurality of operation modes, and includes a computer having a plurality of software programs corresponding to the plurality of operation modes, comprising:

the step of automatically starting the software program corresponding to the operation mode of said image input device, when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer.

22. A method of controlling an image input system, which is connectable to an image input device having a plurality of operation modes, and includes a computer having a single software program which has a plurality

of modes corresponding to the plurality of operation modes, comprising:

the step of automatically starting that one of the plurality of modes of the software in said computer, which corresponds to the operation mode of said image input device when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer.

23. A storage medium that stores a control program for controlling an image input system, which is connectable to an image input device having a plurality of operation modes, and includes a computer having a plurality of software programs corresponding to the plurality of operation modes,

said control program comprising:

a code of the step of automatically starting the software program corresponding to the operation mode of said image input device, when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another

operation mode while said image input device is connected to said computer.

24. A storage medium that stores a control program for controlling an image input system, which is connectable to an image input device having a plurality of operation modes, and includes a computer having a single software program which has a plurality of modes corresponding to the plurality of operation modes,

said control program comprising:

a code of the step of automatically starting that one of the plurality of modes of the software in said computer, which corresponds to the operation mode of said image input device when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer.

25. A program product that comprises a control program for controlling an image input system, which is connectable to an image input device having a plurality of operation modes, and includes a computer having a plurality of software programs corresponding to the plurality of operation modes,

said control program comprising:

a code of the step of automatically starting the software program corresponding to the operation mode of said image input device, when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer.

26. A program product that comprises a control program for controlling an image input system, which is connectable to an image input device having a plurality of operation modes, and includes a computer having a single software program which has a plurality of modes corresponding to the plurality of operation modes,

said control program comprising:

a code of the step of automatically starting that one of the plurality of modes of the software in said computer, which corresponds to the operation mode of said image input device when said image input device is connected to said computer, when a power supply of said image input device is turned on after said image input device is connected to said computer, or when said image input device is switched to another operation mode while said image input device is connected to said computer.

ABSTRACT OF THE DISCLOSURE

This invention has as its object to provide an image input system which is easy to use. To achieve this object, an image input system has an image input device (camera) having a plurality of operation modes, and a computer having a plurality of software programs corresponding to the plurality of operation modes, and when the image input device is connected to the computer, when a power supply of the image input device is turned on after the image input device is connected to the computer, or when the image input device is switched to another operation mode while the image input device is connected to the computer, the software program corresponding to the operation mode of the image input device is automatically started.

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FIG. 1

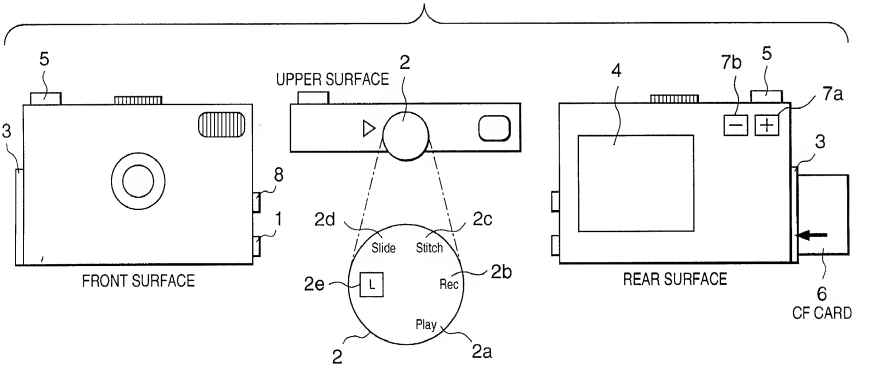

FIG. 2

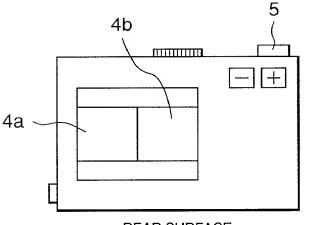

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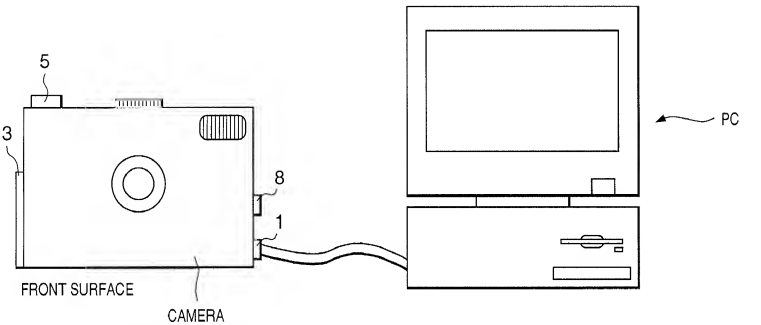
FIG. 3



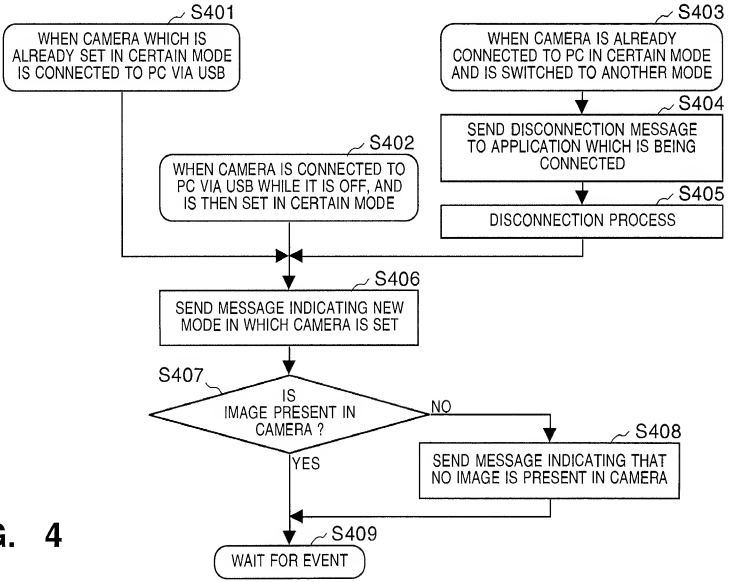

S401
WHEN CAMERA WHICH IS ALREADY SET IN CERTAIN MODE IS CONNECTED TO PC VIA USB
S403
WHEN CAMERA IS ALREADY CONNECTED TO PC IN CERTAIN MODE AND IS SWITCHED TO ANOTHER MODE
S404
SEND DISCONNECTION MESSAGE TO APPLICATION WHICH IS BEING CONNECTED
S402
WHEN CAMERA IS CONNECTED TO PC VIA USB WHILE IT IS OFF, AND IS THEN SET IN CERTAIN MODE
S405
DISCONNECTION PROCESS
S406
SEND MESSAGE INDICATING NEW MODE IN WHICH CAMERA IS SET
S407
IS IMAGE PRESENT IN CAMERA ?
NO
YES
S408
SEND MESSAGE INDICATING THAT NO IMAGE IS PRESENT IN CAMERA
S409
WAIT FOR EVENT

FIG. 4

FIG. 5

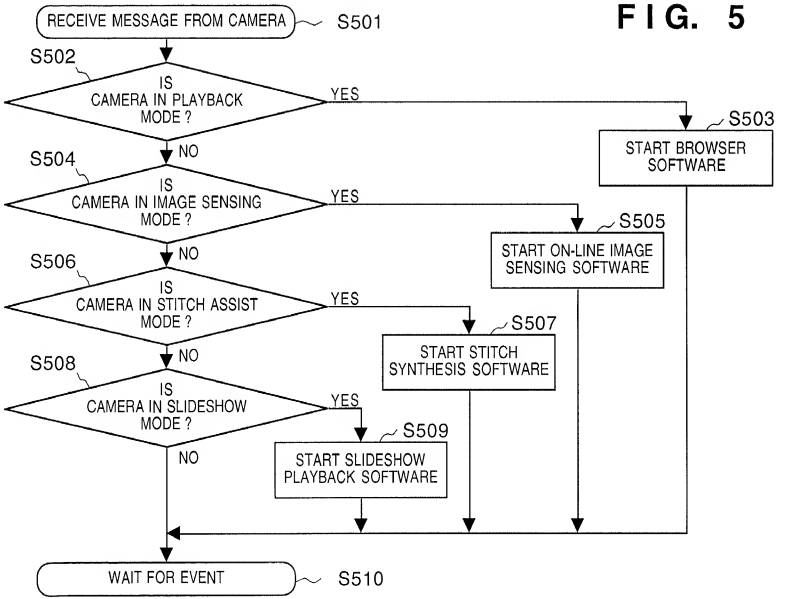
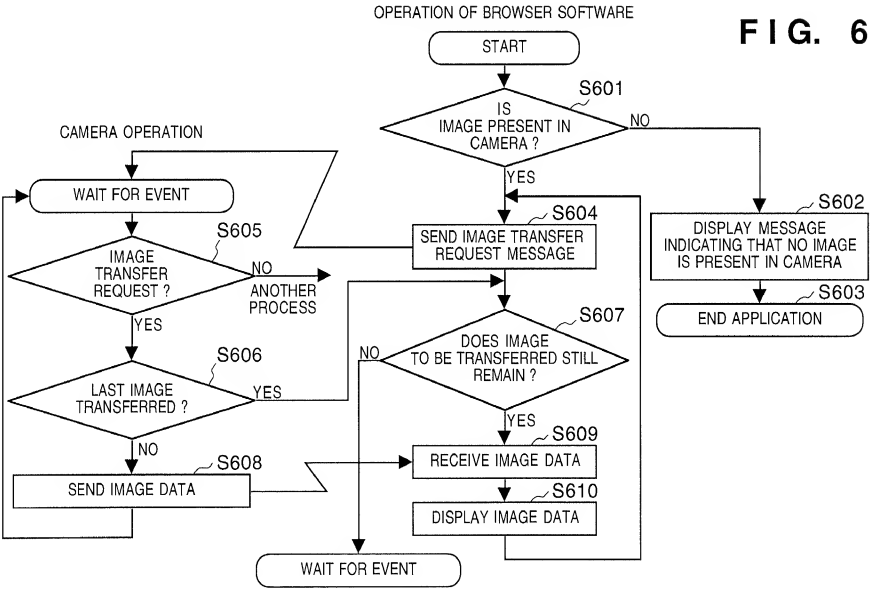

RECEIVE MESSAGE FROM CAMERA
S501
S502
IS CAMERA IN PLAYBACK MODE ?
YES
S503
START BROWSER SOFTWARE
NO
S504
IS CAMERA IN IMAGE SENSING MODE ?
YES
S505
START ON-LINE IMAGE SENSING SOFTWARE
NO
S506
IS CAMERA IN STITCH ASSIST MODE ?
YES
S507
START STITCH SYNTHESIS SOFTWARE
NO
S508
IS CAMERA IN SLIDESHOW MODE ?
YES
S509
START SLIDESHOW PLAYBACK SOFTWARE
NO
WAIT FOR EVENT
S510

FIG. 6


OPERATION OF BROWSER SOFTWARE
START
S601
IS IMAGE PRESENT IN CAMERA ?
NO
YES
S602
DISPLAY MESSAGE INDICATING THAT NO IMAGE IS PRESENT IN CAMERA
S603
END APPLICATION
S604
SEND IMAGE TRANSFER REQUEST MESSAGE
CAMERA OPERATION
WAIT FOR EVENT
S605
IMAGE TRANSFER REQUEST ?
NO
ANOTHER PROCESS
YES
S606
LAST IMAGE TRANSFERRED ?
YES
NO
S607
DOES IMAGE TO BE TRANSFERRED STILL REMAIN ?
NO
YES
S608
SEND IMAGE DATA
S609
RECEIVE IMAGE DATA
S610
DISPLAY IMAGE DATA
WAIT FOR EVENT

66T260'4ST00460

FIG. 7

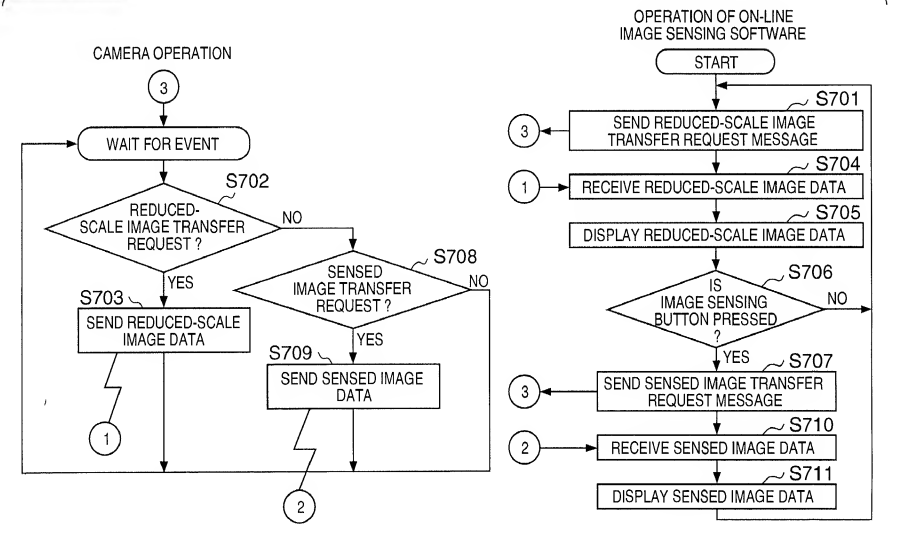


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FIG. 8

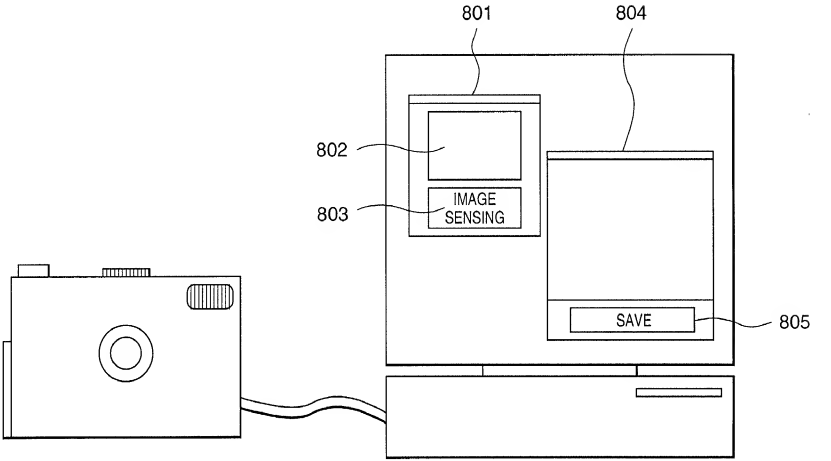


FIG. 9

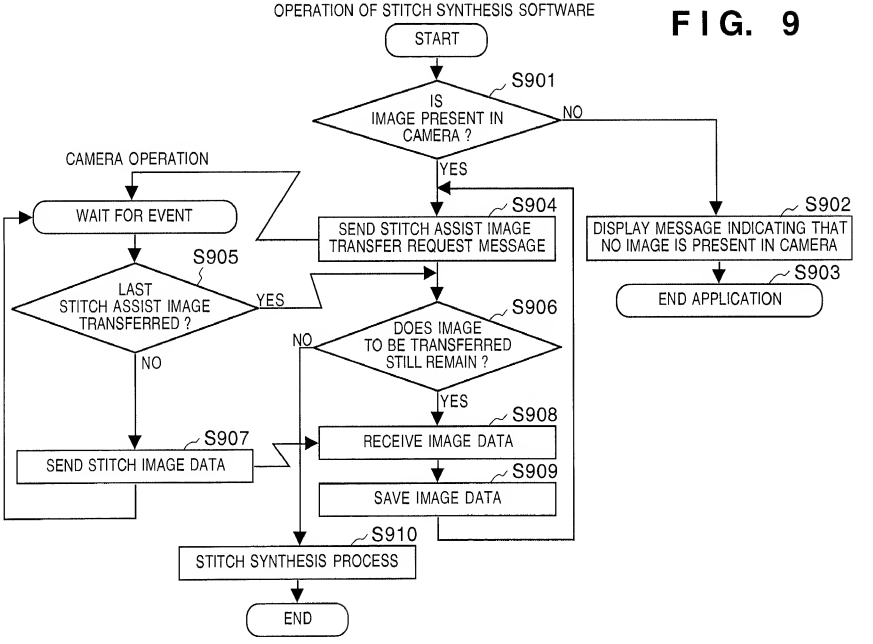

OPERATION OF STITCH SYNTHESIS SOFTWARE
START
S901
IS IMAGE PRESENT IN CAMERA ?
NO
YES
S902
DISPLAY MESSAGE INDICATING THAT NO IMAGE IS PRESENT IN CAMERA
S903
END APPLICATION
CAMERA OPERATION
WAIT FOR EVENT
S904
SEND STITCH ASSIST IMAGE TRANSFER REQUEST MESSAGE
S905
LAST STITCH ASSIST IMAGE TRANSFERRED ?
YES
NO
S906
DOES IMAGE TO BE TRANSFERRED STILL REMAIN ?
NO
YES
S907
SEND STITCH IMAGE DATA
S908
RECEIVE IMAGE DATA
S909
SAVE IMAGE DATA
S910
STITCH SYNTHESIS PROCESS
END

FIG. 10

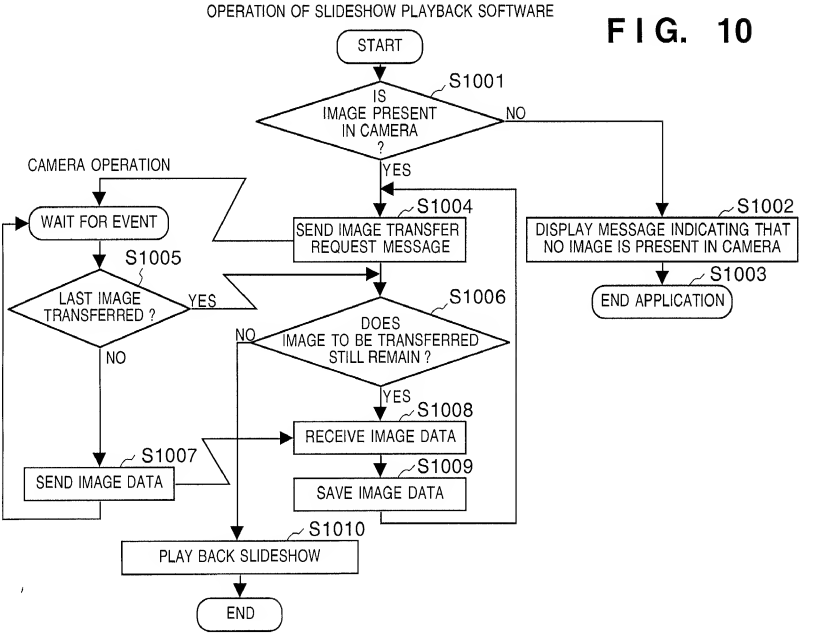
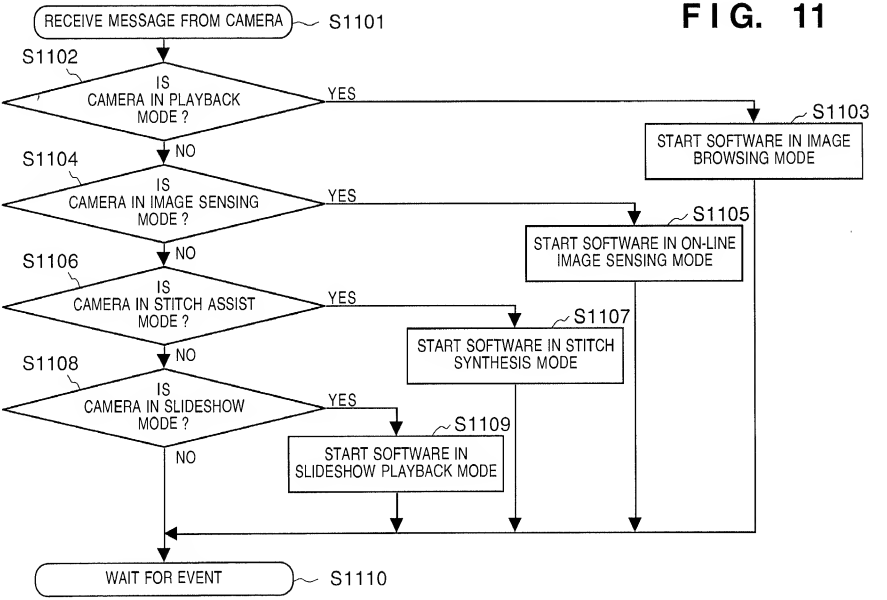

OPERATION OF SLIDESHOW PLAYBACK SOFTWARE
START
S1001
IS IMAGE PRESENT IN CAMERA ?
NO
YES
S1002
DISPLAY MESSAGE INDICATING THAT NO IMAGE IS PRESENT IN CAMERA
S1003
END APPLICATION
CAMERA OPERATION
WAIT FOR EVENT
S1004
SEND IMAGE TRANSFER REQUEST MESSAGE
S1005
LAST IMAGE TRANSFERRED ?
YES
NO
S1006
DOES IMAGE TO BE TRANSFERRED STILL REMAIN ?
NO
YES
S1007
SEND IMAGE DATA
S1008
RECEIVE IMAGE DATA
S1009
SAVE IMAGE DATA
S1010
PLAY BACK SLIDESHOW
END

FIG. 11


RECEIVE MESSAGE FROM CAMERA
S1101
S1102
IS CAMERA IN PLAYBACK MODE ?
YES
S1103
START SOFTWARE IN IMAGE BROWSING MODE
NO
S1104
IS CAMERA IN IMAGE SENSING MODE ?
YES
S1105
START SOFTWARE IN ON-LINE IMAGE SENSING MODE
NO
S1106
IS CAMERA IN STITCH ASSIST MODE ?
YES
S1107
START SOFTWARE IN STITCH SYNTHESIS MODE
NO
S1108
IS CAMERA IN SLIDESHOW MODE ?
YES
S1109
START SOFTWARE IN SLIDESHOW PLAYBACK MODE
NO
WAIT FOR EVENT
S1110

CFM 16-705
C3036

Docket No. _____

COMBINED DECLARATION AND POWER OF ATTORNEY FOR
ORIGINAL , DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL,
DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

IMAGE INPUT SYSTEM, ITS CONTROL METHOD, AND STORAGE MEDIUM
the specification of which

a. [X] is attached hereto

b. [ ] was filed on _____ as application Serial No. _____ and was amended on _____(if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STAGE

C. [ ] was described and claimed in International Application No._____filed on _____and as amended on _____.(if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby specify the following as the correspondence address to which all communications about this application are to be directed:

SEND CORRESPONDENCE TO: MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, N.Y. 10154

DIRECT TELEPHONE CALLS TO: MICHAEL M. MURRAY
(212) 758-4800

[X] I hereby claim foreign priority benefits under Title 35, United States Code § 119 (a)-(d) or under § 365(b) of any foreign application(s) for patent or inventor's certificate or under § 365(a) of any PCT international application(s) designating at least one country other than the U.S. listed below and also have identified below such foreign application(s) for patent or inventor's certificate or such PCT international application(s) filed by me on the same subject matter having a filing date within twelve (12) months before that of the application on which priority is claimed:

[X] The attached 35 U.S.C. § 119 claim for priority for the application(s) listed below forms a part of this declaration.

Country/PCT	Application Number	Date of filing (day,month,yr)	Date of issue (day,month,yr)	Priority Claimed
Japan	10-268606	22, 09, 1998		[X]YES [ ]NO
				[ ]YES [ ]NO
				[ ]YES [ ]NO

[ ] I hereby claim the benefit under 35 U.S.C. § 119(e) of any U.S. provisional application(s) listed below.

Provisional Application No.	Date of filing (day, month, yr)

ADDITIONAL STATEMENTS FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART OR PCT INTERNATIONAL APPLICATION(S DESIGNATING THE U.S.)

I hereby claim the benefit under Title 35, United States Code § 120 of any United States application(s) or under § 365(c) of any PCT international application(s) designating the U.S. listed below.

US/PCT Application Serial No.	Filing Date,	Status (patented, pending, abandoned)/ U.S. application no. assigned (For PCT)
US/PCT Application Serial No.	Filing Date,	Status (patented, pending, abandoned)/ U.S. application no. assigned (For PCT)

[ ] In this continuation-in-part application, insofar as the subject matter of any of the claims of this application is not disclosed in the above listed prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or Imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorneys and/or agents with full power of substitution and revocation, to prosecute this application, to receive the patent, and to transact all business in the Patent and Trademark Office connected therewith: John A. Diaz (Reg. No. 19,550), John C. Vassil (Reg. No. 19,098), Alfred P. Ewert (Reg. No. 19,887), David H. Pfeffer, P.C. (Reg. No. 19,825), Harry C. Marcus (Reg. No. 22,390), Robert E. Paulson (Reg. No. 21,046), Stephen R. Smith (Reg. No. 22,615), Kurt E. Richter (Reg. No. 24,052), J. Robert Dailey (Reg. No. 27,434), Eugene Moroz (Reg. No. 25,237), John F. Sweeney (Reg. No. 27,471), Arnold I. Rady (Reg. No. 26,601), Christopher A. Hughes (Reg. No. 26,914), William S. Feiler (Reg. No. 26,728), Joseph A. Calvaruso (Reg. No. 28,287), James W. Gould (Reg. No. 28,859), Richard C. Komson (Reg. No. 27,913), Israel Blum (Reg. No. 26,710), Bartholomew Verdirame (Reg. No. 28,483), Maria C. H. Lin (Reg. No. 29,323), Joseph A. DeGirolamo (Reg. No. 28,595), Michael A.

Nicodema (Ref. No. 33,199), Michael P. Dougherty (Ref. No. 32,730), Seth J. Altas (Reg. No. 32,454), Andrew M. Riddles (Reg. No. 31,657), Bruce D. DeRenzi (Reg. No. 33,676), Michael M. Murray (Reg. No. 32,537) and Mark J. Abate (Reg. No. 32,527); Alfred L. Haffner, Jr. (Reg. No. 18,919), Harold Haidt (Reg. No. 17,509), John T. Gallagher (Reg. No. 35,516), Steven F. Meyer (Reg. No. 35,613); Kenneth H. Sonnenfeld (Reg No. 33,285), Edward A. Pennington (Reg. No. 32,588), Michael S. Marcus (Reg. No. 31,727) and John E. Hoel (Reg. No. 26,279) of Morgan & Finnegan, L.L.P., whose address is: 345 Park Avenue, New York, New York 10154.

[ ] I hereby authorize the U.S. attorneys and/or agents named hereinabove to accept and follow instructions from _____ as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and/or agents and me. In the event of a change in the person(s) from whom instructions may be taken I will so notify the U.S. attorneys and /or agents named hereinabove.

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Inventor's signature* Hideo Takiguchi date September 16, 1999

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Full name of second joint inventor, if any Atsushi KUMAGAI

Inventor's signature* Atsushi Kumagai date September 17, 1999

Residence c/o Canon Ryusei Mukougaoka, 21-11, Shukugawara 2-chome, Tama-ku, Kawasaki-shi, Kanagawa-ken, Japan

Citizenship JAPAN

Post Office Address c/o CANON KABUSHIKI KAISHA, 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo, Japan

[ ] ATTACHED IS ADDED PAGE TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR SIGNATURE BY THIRD AND SUBSEQUENT INVENTORS FORM.

* Before signing this declaration, each person signing must:

1. Review the declaration and verify the correctness of all information therein; and

2. Review the specification and the claims, including any amendments made to the claims.

After the declaration is signed, the specification and claims are not to be altered.

To the inventor(s):

The following are cited in or pertinent to the declaration attached to the accompanying application:

Title 37, Code of Federal Regulation, § 1.56

Duty to disclose information material to patentability.

(a) A patent by its very nature is affect with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in patent was cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

Title 35, U.S. Code § 101

Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Title 35 U.S. Code § 102

Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent,

(b) the invention was patented or described in a printed publication in this or foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate field more than twelve months before the filing of the application in the United States, or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or

(f) he did not himself invent the subject matter sought to be patented, or

(g) before the applicant's invention thereof the invention was made in this country by another had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other ...

Title 35, U.S. Code § 103

Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Title 35, U.S. Code § 112 (in part)

Specification

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms also enable any person skilled in the art to which it pertains, or with which it is mostly nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Title 35, U.S. Code § 119

Benefit of earlier filing date in foreign country; right of priority

An application for patent for an invention filed in this country by any person who has, or whose legal representatives or assigns have, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, shall have the same effect as the same application would have if filed in this country on the date on which the application for patent for the same invention was first filed in such foreign country, if the application in this country is filed within twelve months from the earliest date on which such

foreign application was filed; but no patent shall be granted on any application for patent for an invention which had been patented or described in a printed publication in any country more than one year before the date of he actual filing of the application in this country, or which had been in public use or on sale in this country more than one year prior to such filing.

Title 35, U.S. Code § 120

Benefit or earlier filing date in the United States

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, which is filed by an inventor or inventors named in the previously filed application shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

Please read carefully before signing the Declaration attached to the accompanying Application.

If you have any questions, please contact Morgan & Finnegan, L.L.P.

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